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APPLICATION NUMBER: *60/496,514*
FILING DATE: *August 20, 2003*
RELATED PCT APPLICATION NUMBER: *PCT/US04/26886*

Certified by

Jon W Dudas

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PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION under 37 CFR § 1.53(c).

EXPRESS MAIL LABEL NO: EV251287864US DATE OF DEPOSIT: August 20, 2003	Docket Number: PDC-0010	Type a plus sign (+) inside this box→	+

INVENTOR(S)/APPLICANT(S)

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☐ Additional inventors are being named on the separately numbered sheets attached hereto

TITLE OF THE INVENTION (280 characters max)

Improved Portable Fire Hydrant

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ENCLOSED APPLICATION PARTS (check all that apply)

☒ Specification Number of Pages: 4 ☒ Drawing(s) Number of Sheets: 21	☐ Claims (optional) ☒ Other (specify) U.S. Patent No. 5,901,738

METHOD OF PAYMENT (check one)

☒ A check or money order is enclosed to cover the Provisional filing fee:
- ☒ $80.00 Small Entity
- ☐ $160.00 Large Entity

☐ The Commissioner is hereby authorized to charge filing fee and credit Deposit Account No.: 23-3050

☒ The Commissioner is hereby authorized to charge Deposit Account No. 23-3050 any fee deficiency or credit account for any overpayment.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are

Respectfully submitted,

SIGNATURE 

Date: August 20, 2003

TYPED or PRINTED NAME Daniel D. Biesterveld

REGISTRATION NO. 45,898 (if appropriate)

PROVISIONAL APPLICATION FILING ONLY

Improved portable fire hydrant

The enclosed figures and descriptions relate to improved engagement mechanisms for portable fire hydrants. The design and function of portable fire hydrants is disclosed in U.S. Pat. No. 5,901,738, included in its entirety with this provisional application. Specifically, this provisional application is directed to various improvements in the design and function of various portable fire hydrant components, including:

(a) Portable to fixed hydrant connections, preferably portable to below grade hydrant connections, such as those shown in Figures 1-7.

In Figure 1, a plurality of fins are connected (preferably welded) to the center shaft. In certain preferred embodiments, three fins are used. A threaded ring is connected (preferably welded) to the fins. The threaded ring is used to connect the hydrant body to a threaded collar on the pipe. Preferably the entire pipe is below grade.

Figure 2 shows a bayonet type connector. As shown in Figure 2, the hydrant body has a lugged ring attached to its bottom. A plurality of lugs drop into vertical slots located on the connector collar. Turning the hydrant relative to the pipe engages the lugs in horizontal slots. Preferably, the horizontal slots have a cam surface that tightens the connection during rotation.

Figure 3 shows an internal cam connector. As shown in Figure 3, a plurality of pins mounted in the connector fit into slots in the hydrant body. The slots in the hydrant body have vertical portions and horizontal portions. Turning the hydrant relative to the pipe engages the lugs in the horizontal slots. Preferably, the horizontal slots have a cam surface that tightens the connection during rotation.

Figure 4 shows an external cam connector. As shown in Figure 4, a plurality of pins mounted in the connector fit into horizontal slots in an outside ring connected to the hydrant body. Optionally, the slots in the outside ring may include vertical slots for the pins if the lower portion of the outside ring forms a continuous circle. Turning the hydrant relative to the connector engages the lugs in the horizontal slots. Preferably, the horizontal slots have a cam surface that tightens the connection during rotation.

Figure 5 shows a toggle latch connector. As shown in Figure 5, the hydrant is inserted into a connector attached to the pipe. Operating a plurality of toggle clamps causes the latching tangs to engage a groove in the collar.

Figure 6 shows a ball lock quick disconnect connector. As shown in Figure 6, lifting the outer sleeve against the force of the spring allows a plurality of balls to move outward. The outward movement of the balls causes them to disengage from the groove. Releasing the outer sleeve allows the spring to force the outer sleeve downward, forcing the balls to into the groove for a positive connection.

Figure 7 shows a Stortz-type connector. The use and design of Stortz-type connectors is known to those skilled in the art. The Stortz-type connector operates in similar fashion to the bayonet system in that includes a lug that locks by turning the hydrant relative to the pipe. The pipe lug and hydrant lug interlock.

(b) Portable hydrant pump operating mechanisms, such as hydraulic and battery-operated mechanisms, such as those shown in Figure 8.

Figure 8 shows an exploded view of an hydraulically operated portable hydrant. The numbers used in the drawing represent the following:

1) hydrant body;
2) Stortz-type hose connector;
3) check valve;
4) seals;
5) linking member;
6) valve;
7) piston;
8) handle;
9) handle extension
10) lower seal;
11) hydrant connector;
12) connection seal;
14) pipe connector;
15) bearing sleeve;
16) piston;
17) center shaft;
18) spring;
19) seal; and
20) nut.

Pumping handle 8 forces hydraulic fluid into the chamber via piston 7 and creates hydraulic pressure. The hydraulic pressure is used to drive the center shaft 17 down and open the below grade water valve. Optionally, the hydraulic pressure can be generated using a battery operated pump. The battery operated pump can connect to the hydrant with a quick disconnect hydraulic line.

(c) Portable to below grade hydrant seals, such as those shown in Figures 9-14.

Figure 9 shows a rubber face seal used with a bayonet connector. The seal is effected by causing compression between the hydrant body and the connector attached to the pipe.

Figure 10 shows a molded rubber Stortz-type lip seal. A thin cross-section of the lip seal allows easier deflection/compression of the seal. Water pressure inside the hydrant helps create a tighter seal.

Figure 11 shows a spring energized TPFE face cup seal. The leaf–type spring inside the seal forces cup shape of seal outward, creating a seal on both horizontal faces at the connection of the hydrant body and connector. Water pressure inside the hydrant helps create a tighter seal by forcing seal against horizontal surfaces.

Figure 12 shows a spring energized TPFE radial cup seal. This seal performs similar to the seal in Figure 11, except the seal seals radially.

Figure 13 shows an O-ring energized TPFE radial band seal. This seal performs similar to the seal in Figure 11, except the energizing force for the seal is provided by an o-ring instead of internal leaf springs.

Figure 14 shows an inflatable bladder radial seal. As shown in Figure 14, an inflation passageway is used to introduce fluid to inflate the inflatable

bladder seal. The inflated seal creates a seal between the hydrant and connector. Hydraulic and/or pneumatic pressure can be used to inflate the bladder seal.

(d) Hydrant identification and locating devices, including the use of radio frequency or global positioning systems, such as those shown in Figures 15-16.

Figure 15 shows an RF transmitter installed near a hydrant cover. The RF transmitter can send signals to receiving equipment used by fire personnel to locate the cover.

Figure 16 shows a GPS device installed near a hydrant cover. The GPS device can send signals to receiving equipment used by fire personnel to locate the cover.

(e) Mechanisms for locking the lid, such as those shown in Figures 17 and 18.

Figure 17 shows a locking security device that uses an electronic keypad. When the correct code is entered, locking pins retract and allow the cover to be removed. Alternatively, the lock can be a mechanical combination lock, a key activated lock, or any combination thereof.

Figure 18 shows a magnetically deactivating lock. A magnetic device placed over the surface of the hydrant cover causes locking pins to retract, allowing the cover to be removed.

(f) Valve shoe configurations, such as those shown in Figures 19-21.

Figure 19 shows a fitting having a valve housing and a hydrant stand pipe connection. Preferably, the valve housing and hydrant stand pipe connection are integrally formed. In certain embodiments, the connections are configured for use with Megalug connectors.

Figure 20 is similar to Figure 19, except it includes a second connection for expanding the piping system. The second connection can also be used as a clean-out.

Figure 21 is similar to Figure 20, except it includes a third connection for further expansion. Additional connections can also be added.

(g) In hydrant piping systems, a lateral valve is usually located between the main water line and the hydrant connection. The valve facilitates maintenance operations. The lateral valve is normally in the open position and the underground hydrant valve is used to turn the hydrant on and off. In order to service the hydrant, the lateral valve (or some other valve upstream) must be closed to shut off water flow to the hydrant.

Various lateral valve actuators, such as pneumatic or hydraulic operation can be used with a portable fire hydrant system. The pneumatic and/or hydraulic actuator systems can use manual pumps or energy driven pressure generating equipment, such as an electric or gas motor.

Further, the lateral valve can include liquid nitrogen freezing or use of an air bag to restrict flow. For example, liquid nitrogen can be pumped into a freezing collar around the lateral line. The liquid nitrogen then freezes a slug of water in the lateral line, allowing the hydrant connection to be serviced.

Alternatively, a hydraulic or pneumatic operated bladder device could be inserted into the lateral line and inflated to prevent water flow.

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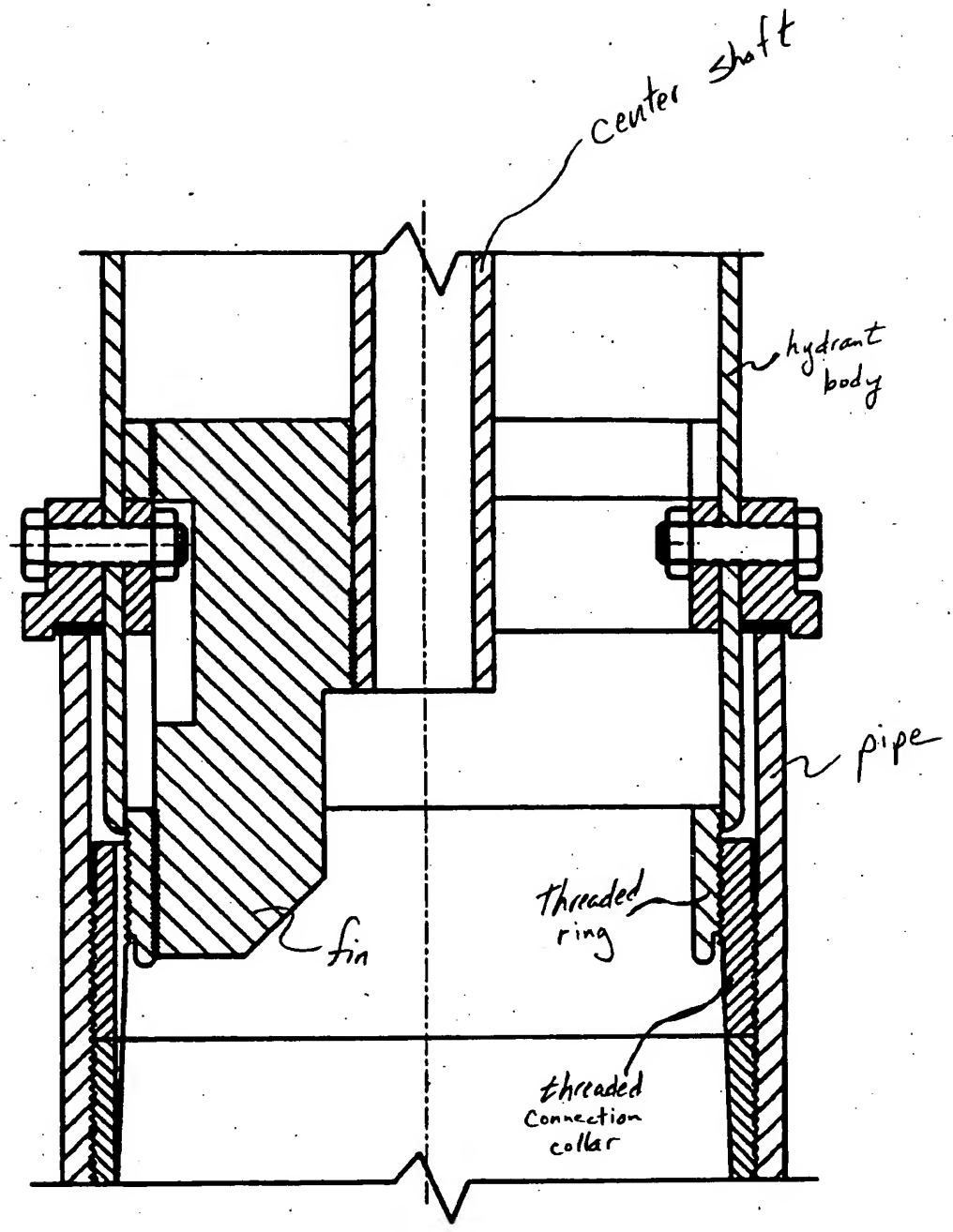

THREADED CONNECTOR

Figure 1

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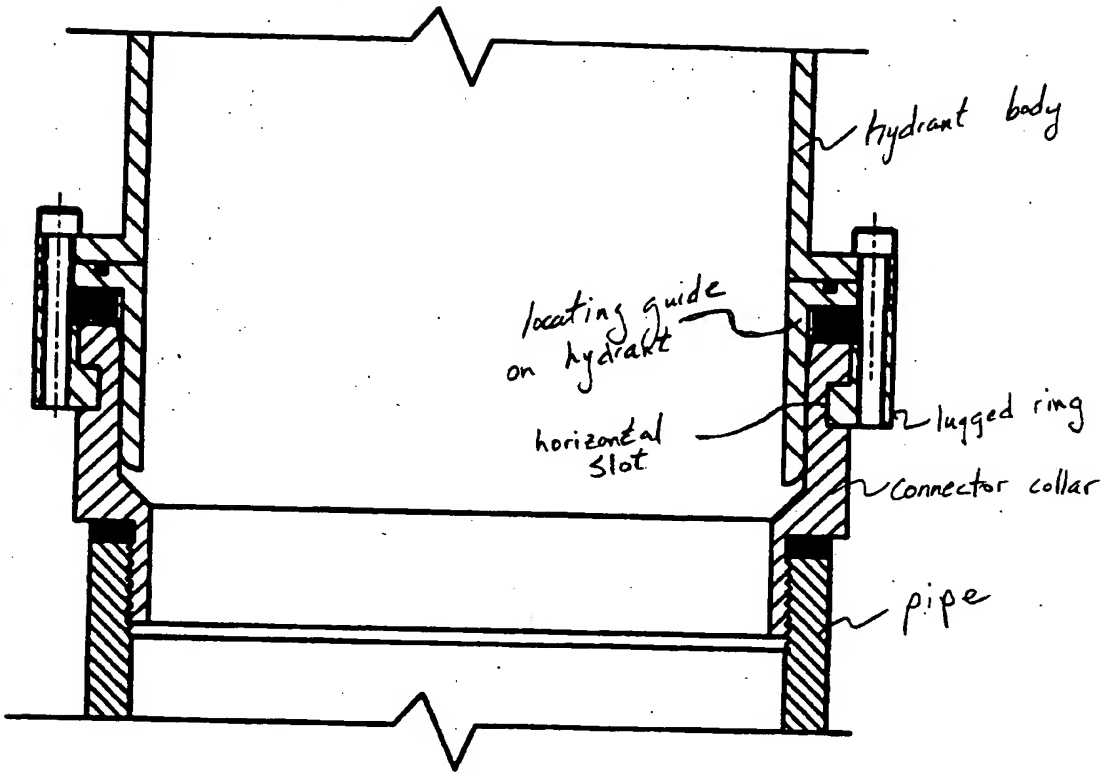

BAYONET CONNECTOR

SIMILAR TO STORTZ BUT
NO FLOW RESTRICTIONS

Figure 2

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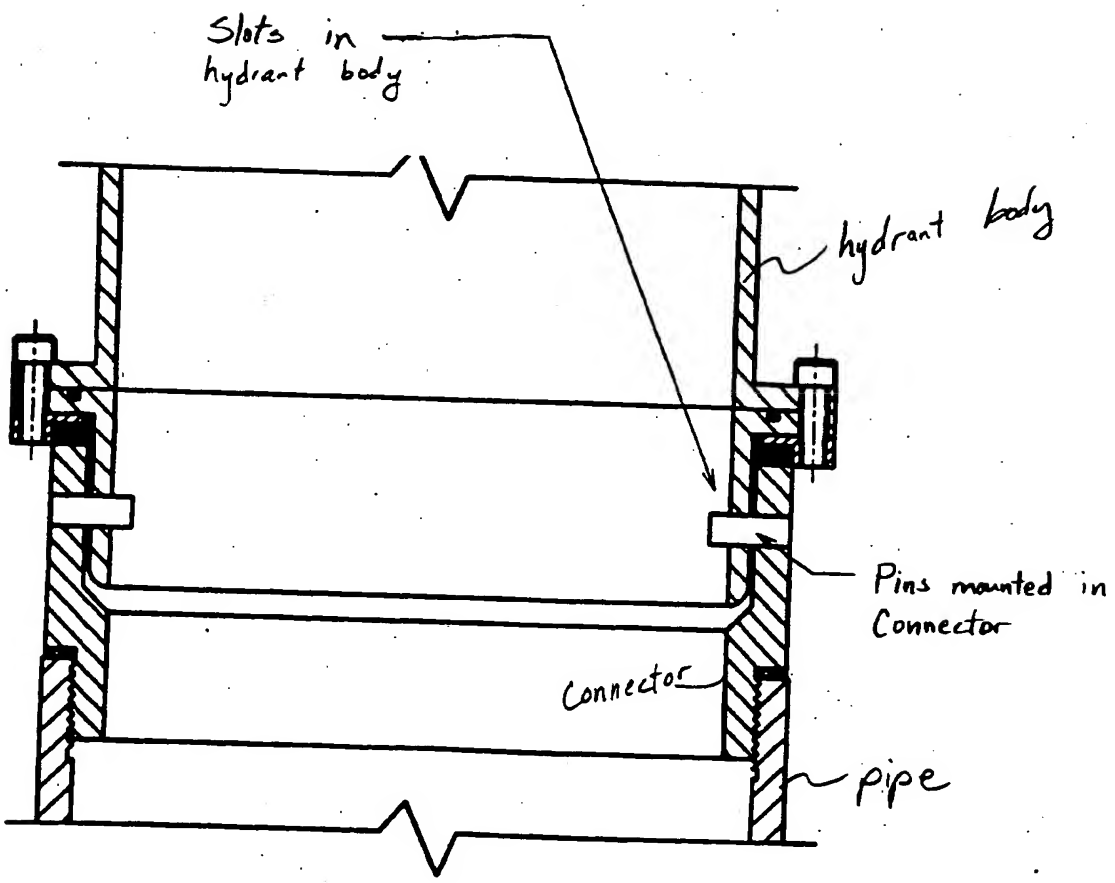

INTERNAL CAM CONNECTOR

Figure 3

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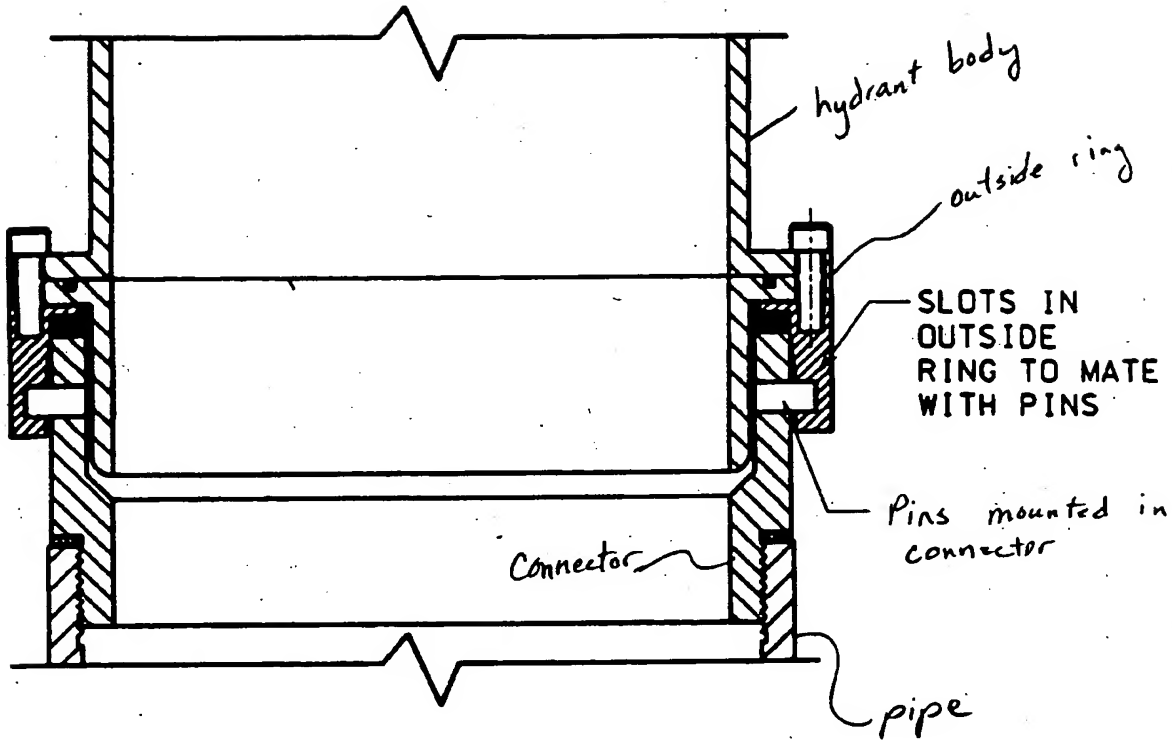

EXTERNAL CAM CONNECTOR

Figure 4

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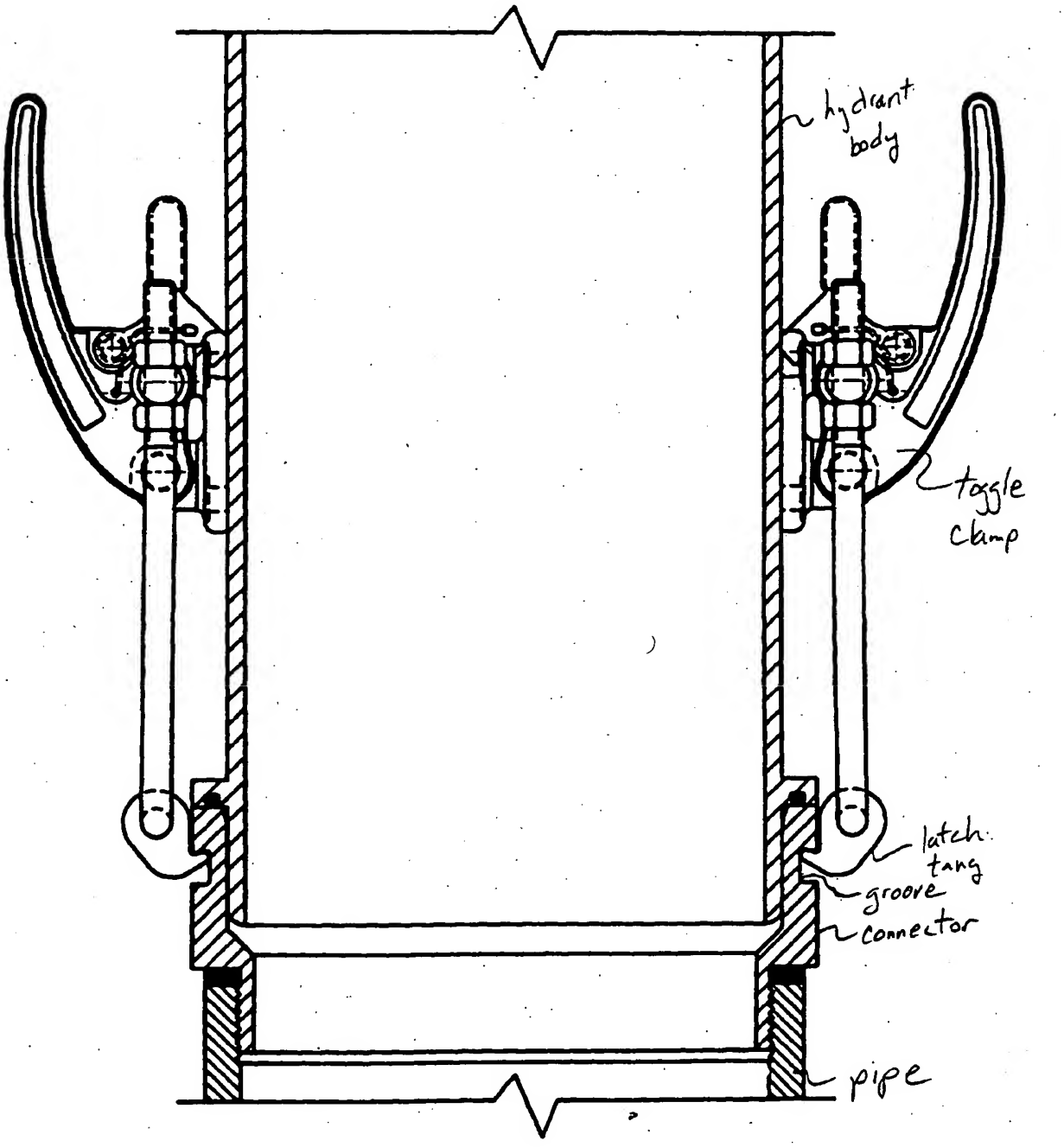

TOGGLE LATCH CONNECTOR

Figure 5

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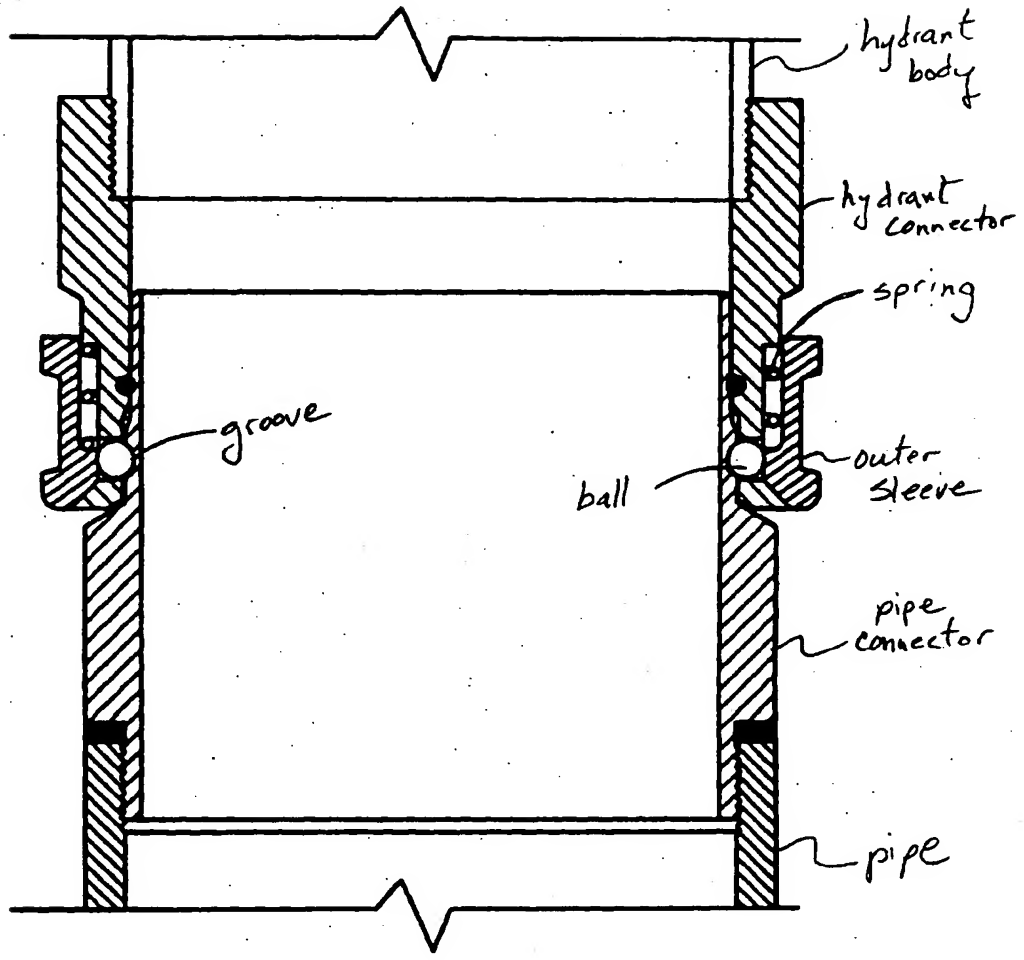

BALL LOCK QUICK DISCONNECT CONNECTOR

Figure 6

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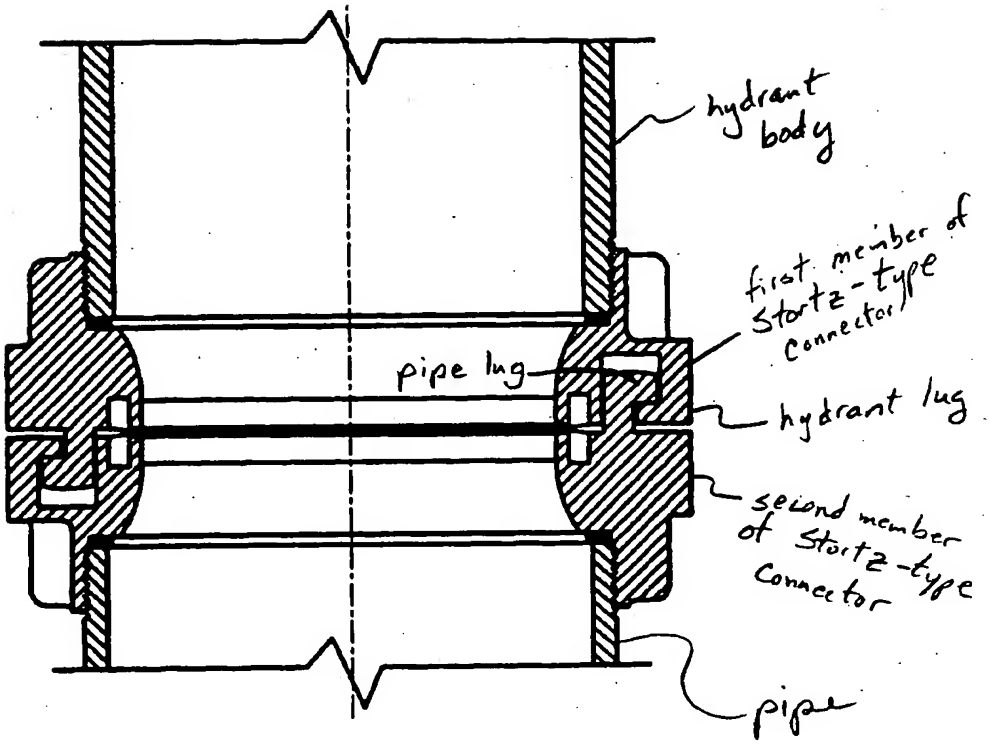

STORTZ CONNECTOR

Figure 7

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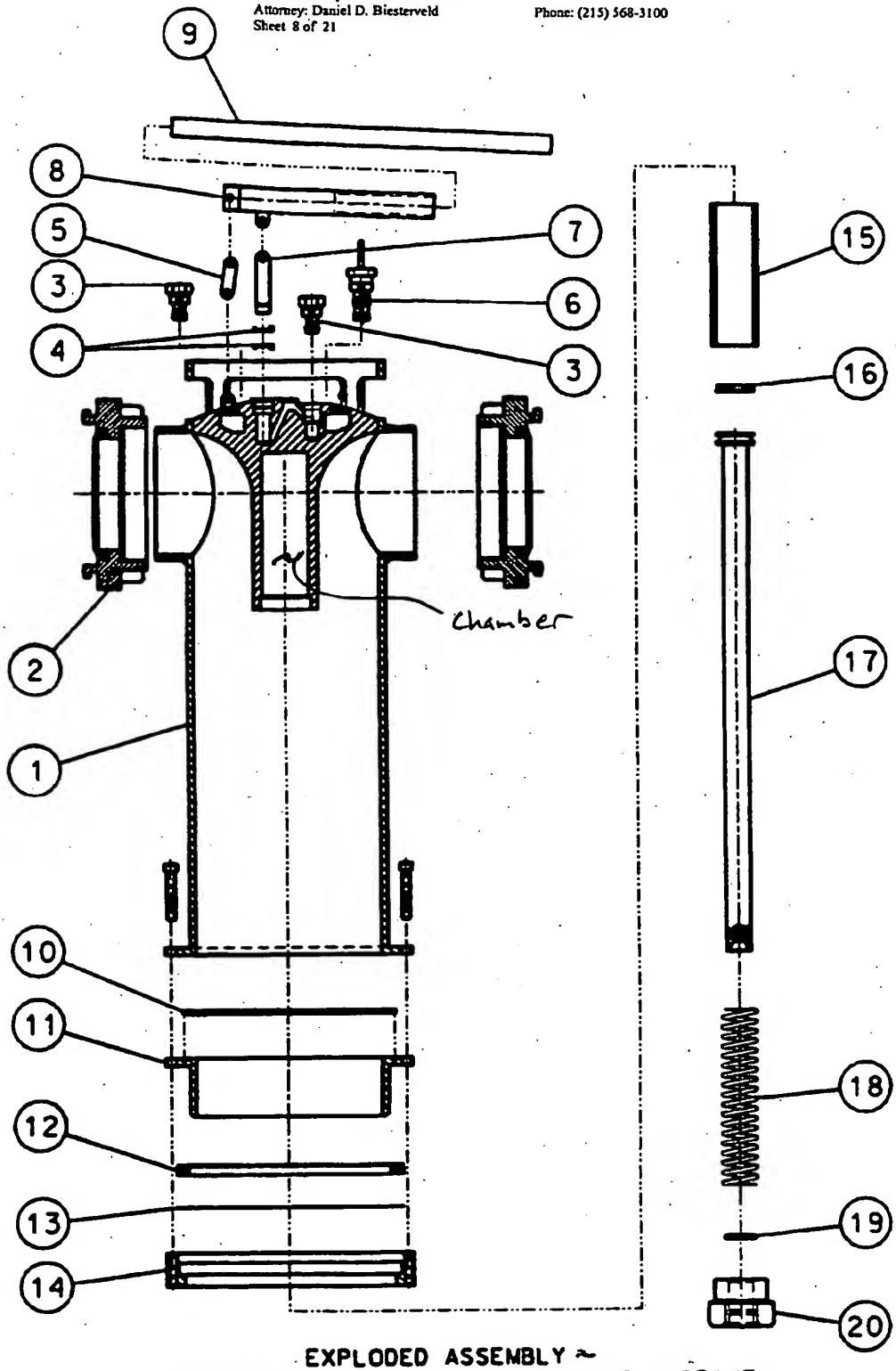

EXPLODED ASSEMBLY ~
HYDRAULICALLY OPERATED PORTABLE HYDRANT

Figure 8

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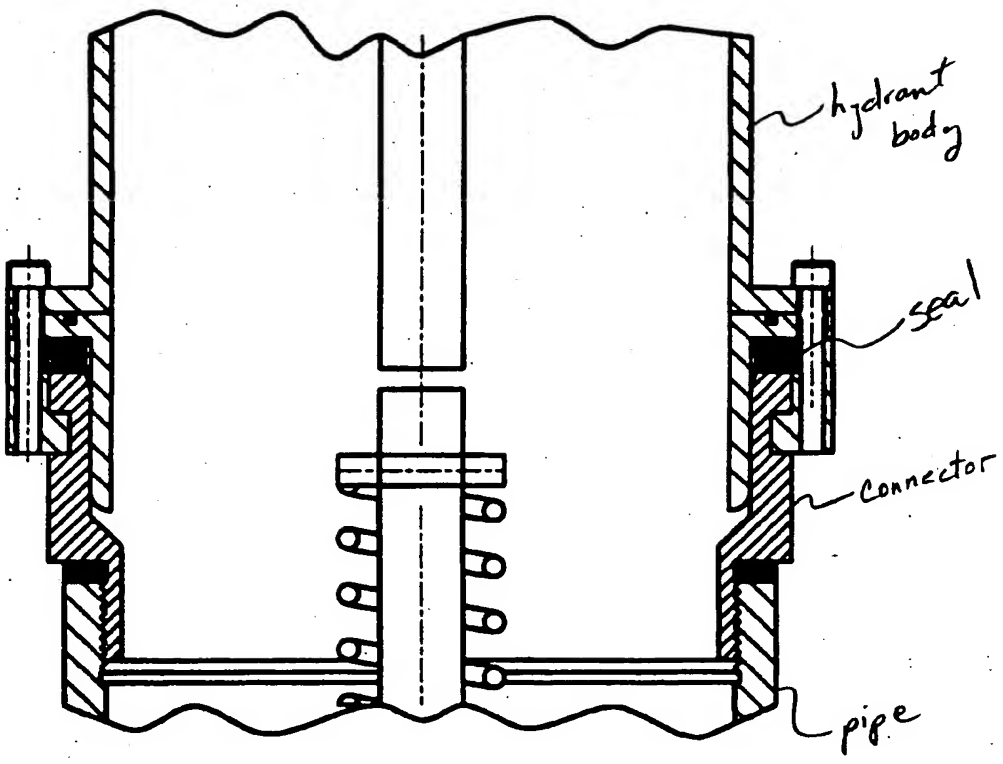

#1 FLAT RUBBER FACE SEAL

Figure 9

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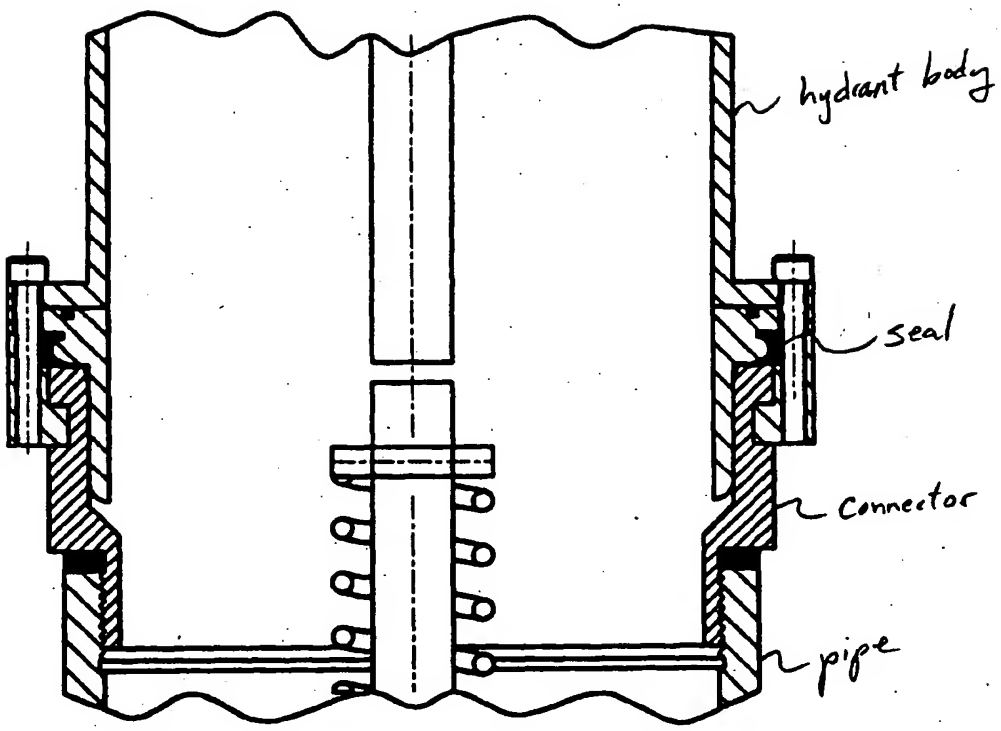

#2 MOLDED RUBBER STORTZ TYPE LIP SEAL

Figure 10

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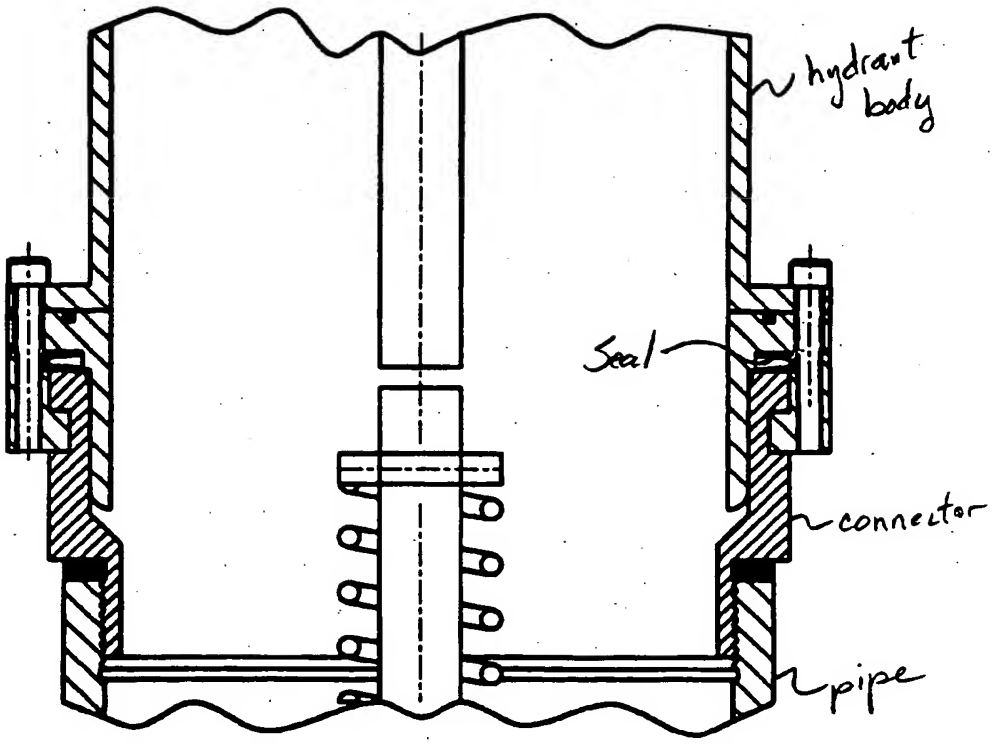

#3 SPRING ENERGIZED TPFE FACE CUP SEAL

Figure 11

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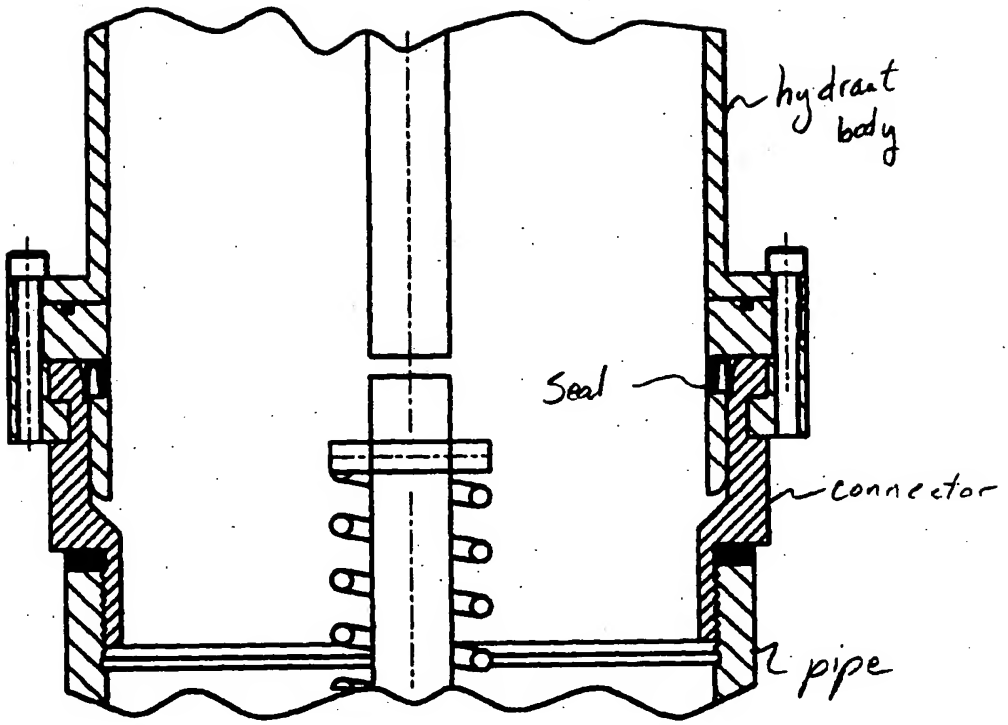
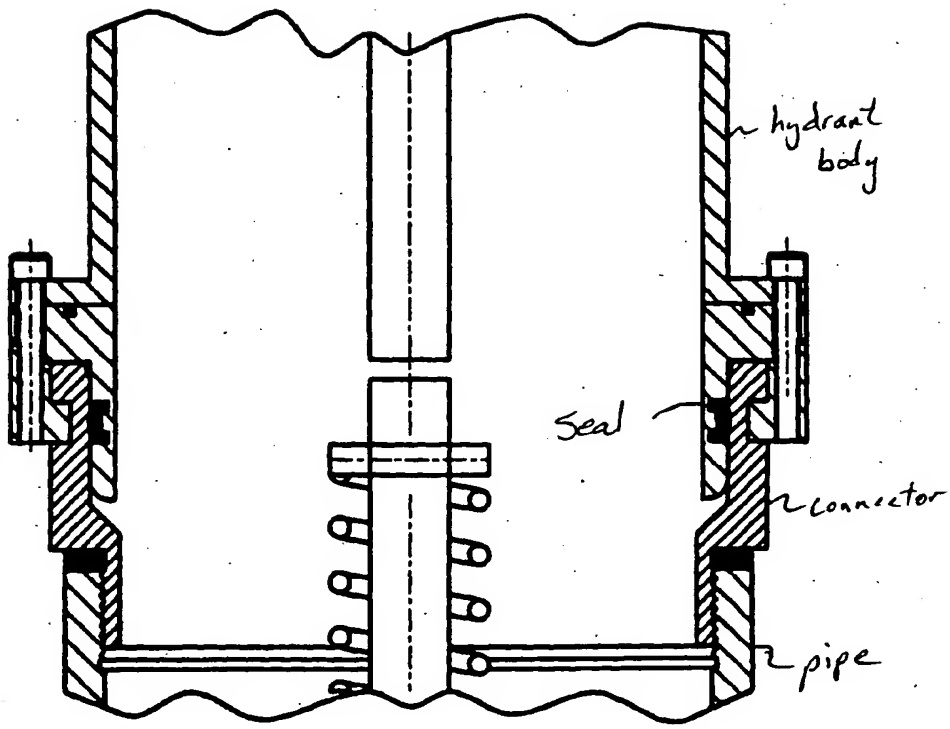


#4 SPRING ENERGIZED TPFE RADIAL CUP SEAL

Figure 12



#5 O-RING ENERGIZED TPFE RADIAL BAND SEAL

Figure 13

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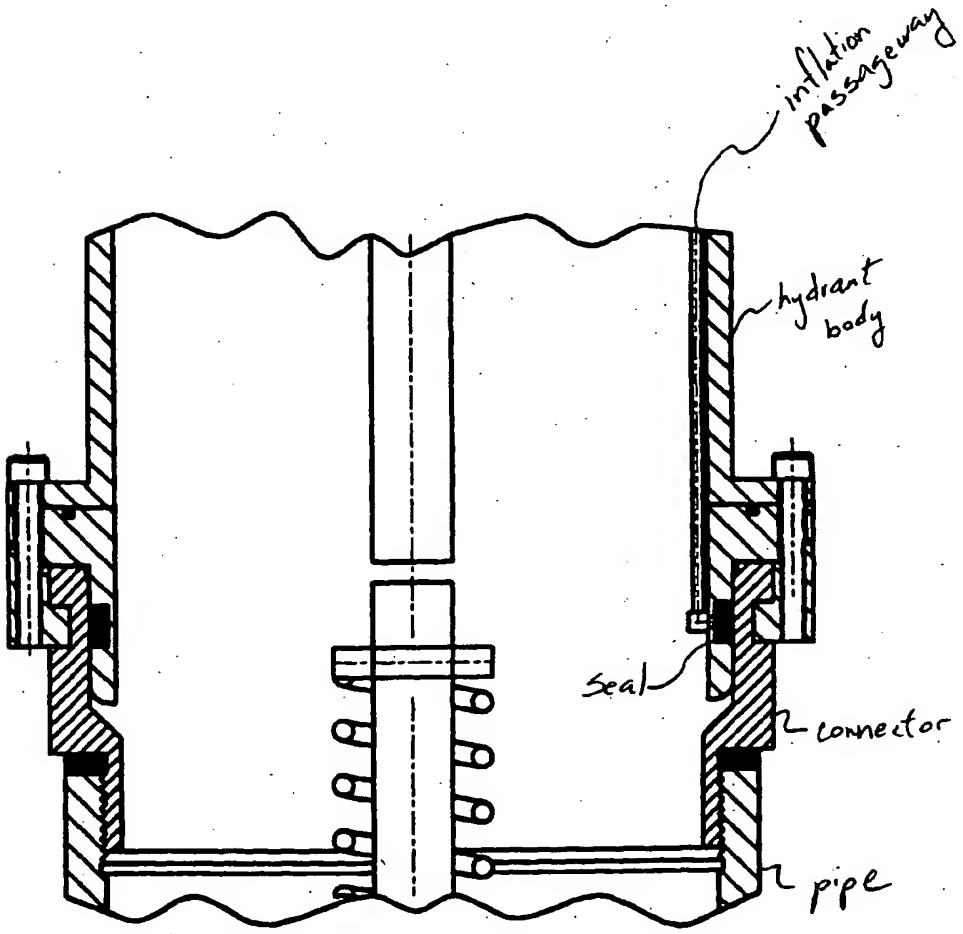

#6 INFLATABLE BLADDER RADIAL SEAL

Figure 14

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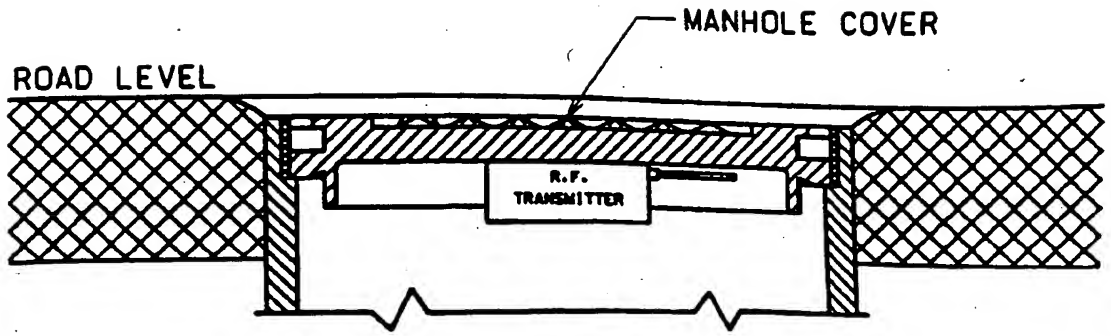
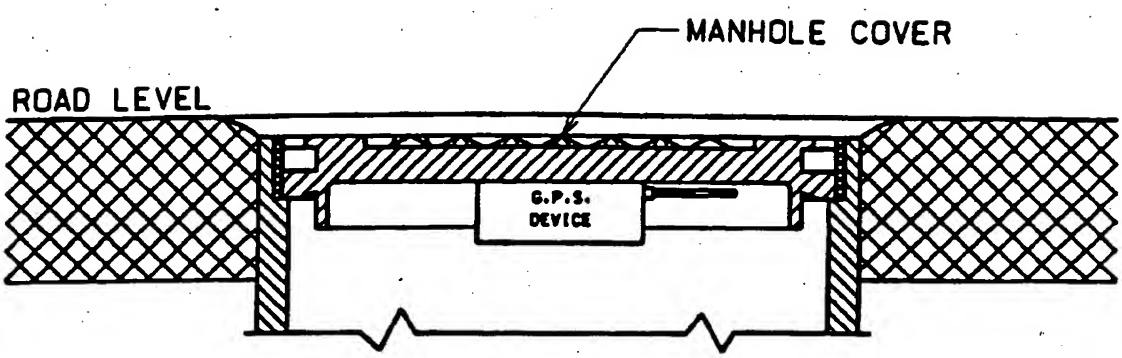


RADIO FREQUENCY

Figure 15



GLOBAL POSITIONING SATELITE

Figure 16

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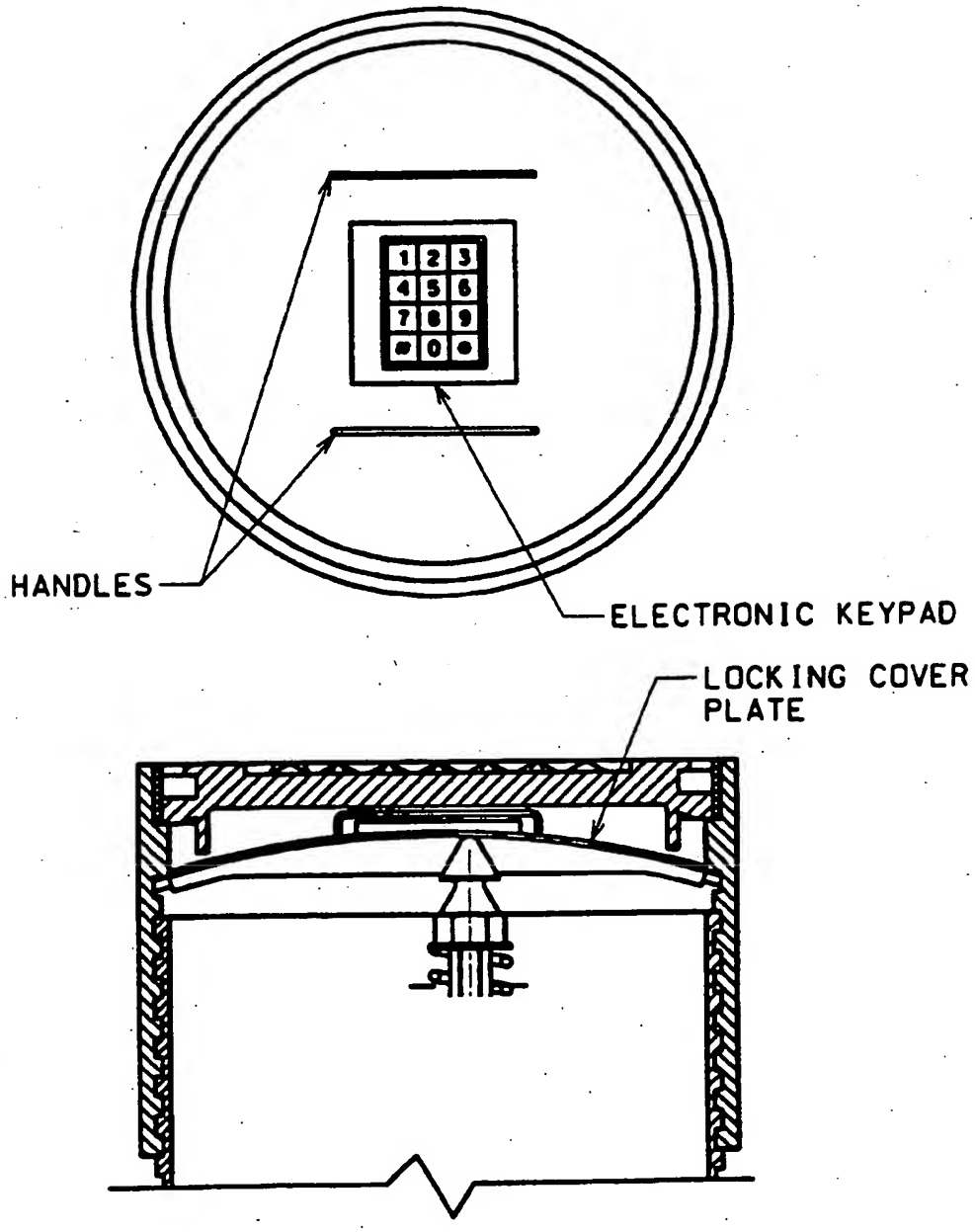

LOCKING SECURITY DEVICE

Figure 17

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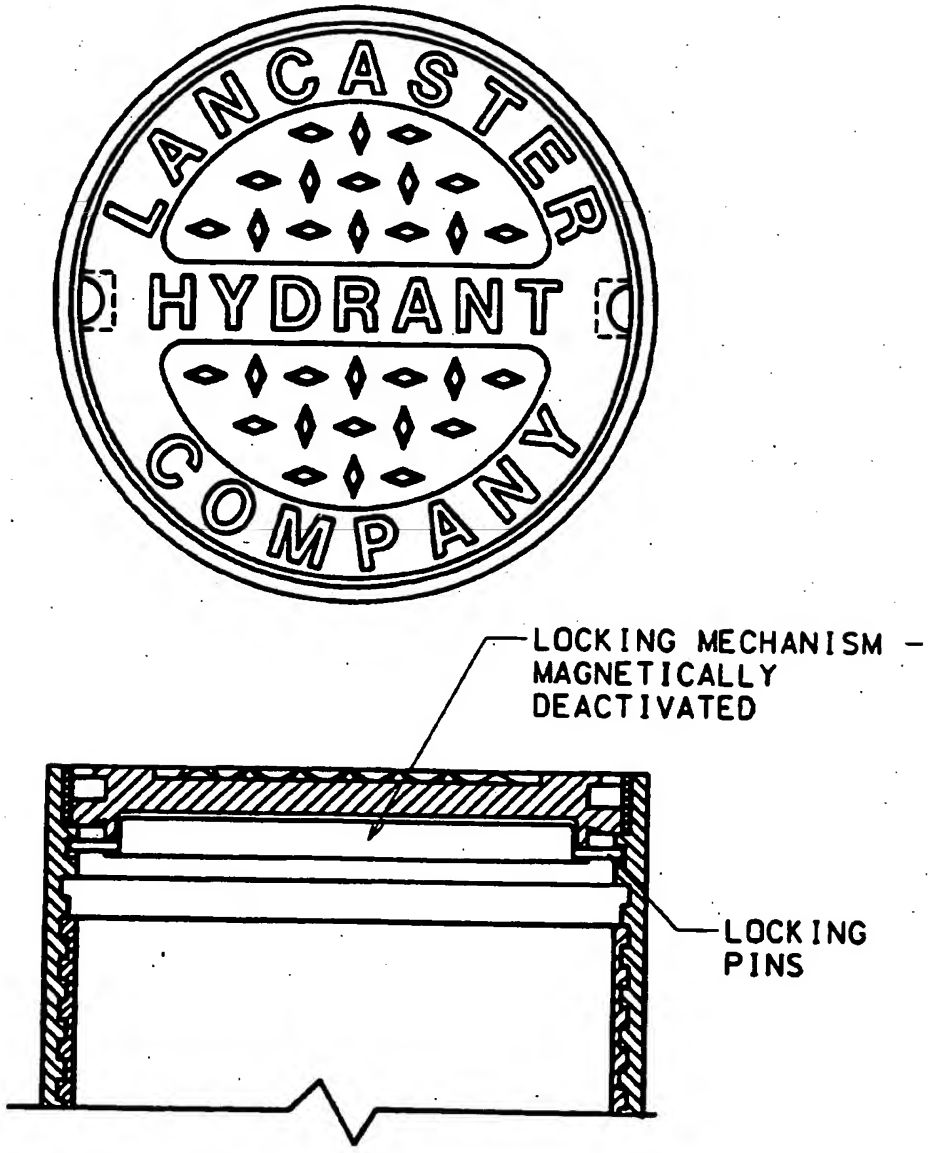

Figure 18

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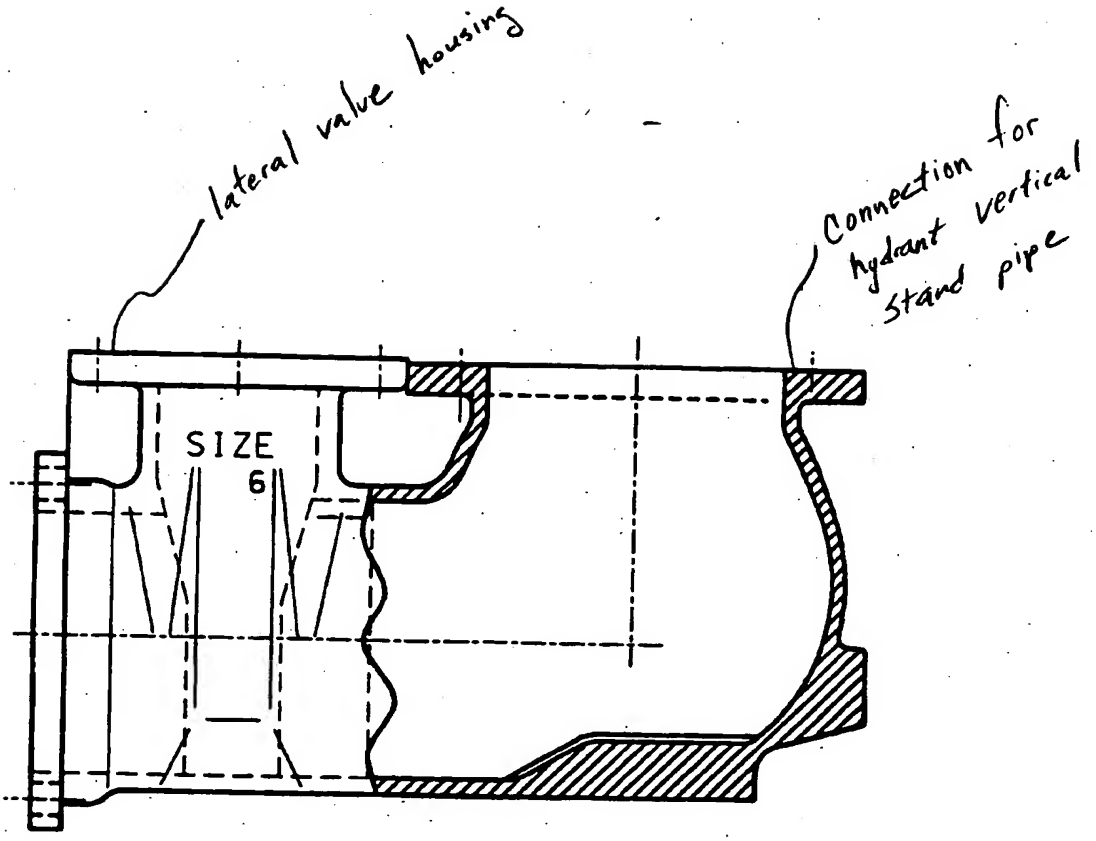

COMBINATION SHOE

Figure 19

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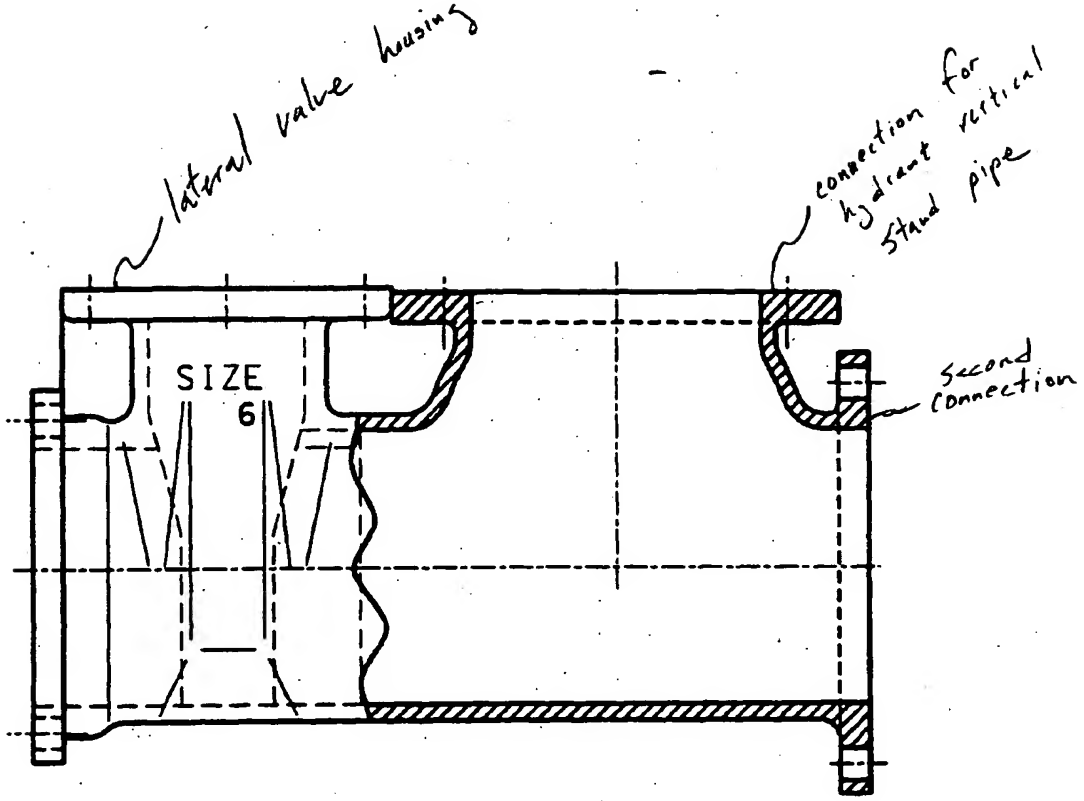

COMBINATION MEGALUG TEE SHOE

Figure 20

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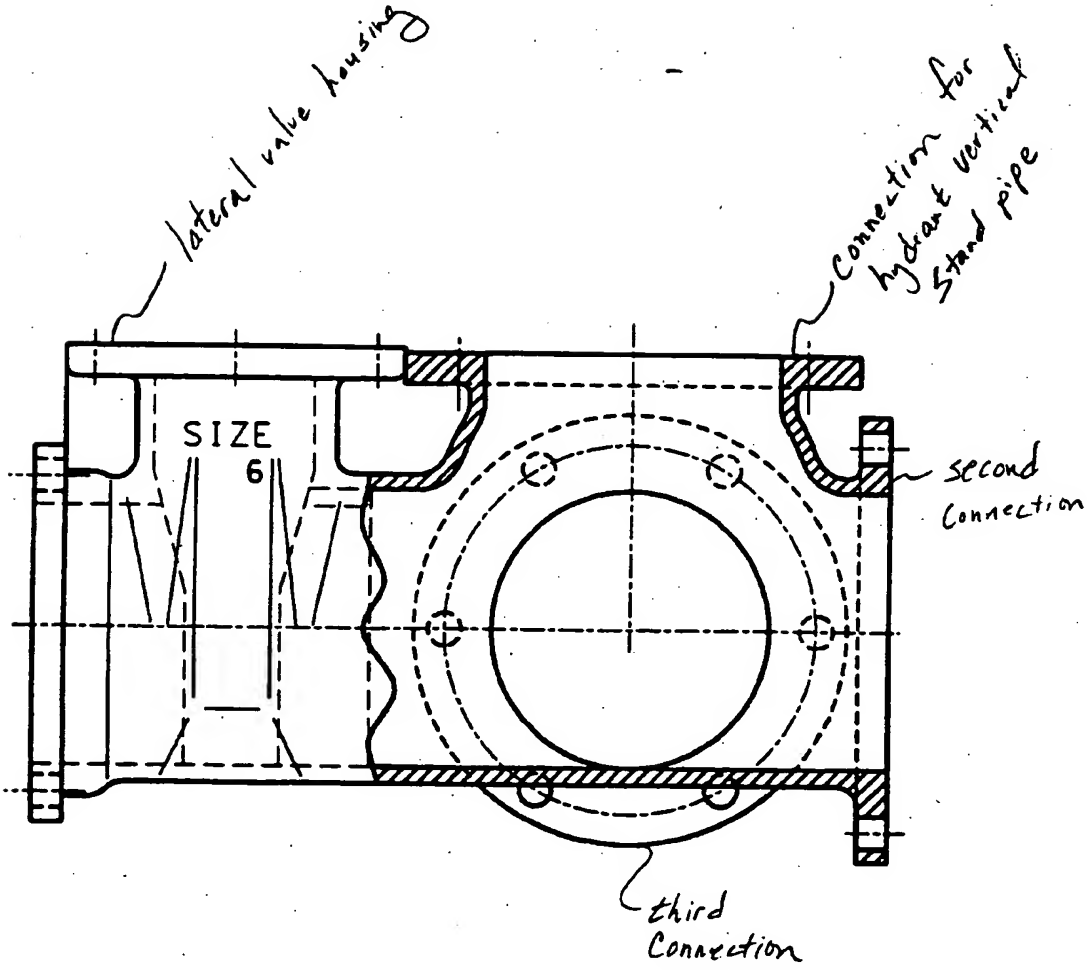

COMBINATION CROSSED 3-CAPPED SHOE

Figure 21